Presentation on BDS Regulation from the Perspective of Competitive Fiber Providers-- Lightower, Lumos, and Unite Private Networks

October 13, 2016

lightower fiber networks

LUMOS NETWORKS

Unite PRIVATE NETWORKS

We support the proposed order's "light touch" approach to Ethernet offered by CFPs

- Lightower, Lumos and UPN are all competitive fiber providers ("CFPs"), providing Ethernet BDS to a wide range of customers
- Our concerns were focused on the suggestion in the notice that "benchmarks" based on ILEC special access rates be imposed on all providers of BDS, even Ethernet BDS, in census blocks deemed "non-competitive" by the FCC
- We understand that the Chairman's proposed order will maintain the current light touch regulation of Ethernet by all providers.
- We fully support application of light touch regulation to CFPs, which have no market power. Market power has always been the *sine qua non* of price regulation, and rightly so. As the Commission recognized in its Order in May, "competition is best." Where there is competition, there is no need for price regulation. And wherever we offer service, there is competition. We have no market power.
- The Commission should reject Verizon's suggestion that CFPs be subject to benchmarks immediately if they were offering Ethernet in 2005, as there is no basis to find that those that offered Ethernet in 2005 have market power
- The Commission should also reject Verizon's suggestion that all new entrants providing Ethernet should be regulated, beginning in approximately 3 years, because there is no basis for the Commission to conclude at this time that we and other CFPs will have market power then.
- As we will discuss, benchmark regulation of CFPs is unnecessary and would in fact be disastrously counterproductive, undermining the Commission's goals of fostering competition and encouraging construction of new high bandwidth networks
- On October 5, 2016, we filed a letter, attaching declarations from all 3 companies in support of this position, and summarizing the reasons for our position

Benchmark regulation of CFPs' pricing would have the unintended effect of undermining the Commission's goals

- Benchmark regulation of CFPs would . . .
  - REDUCE COMPETITION
    - CFPs would have to reduce investment in new networks due to the cost, uncertainty and risk of attempting to comply with benchmark regulation
    - Investment capital would dry up as equity and debt sources fear uncertainty
    - CFPs are a critical piece to building new networks for hospitals, schools, public safety organizations and others; only CFP's spend all their cash flow on new network builds
  - REDUCE CUSTOMER OPTIONS
    - CFPs provide complex advanced technology solutions that are very different from conventional special access; for example, critical networks for hospitals that are 100% diverse from the ILEC network and thus prevent downtime at life-saving facilities, and custom high-bandwidth networks for school districts
    - Benchmark regulation would discourage CFPs from investing in these kinds of important services—customers would have no choice but to try to get these services from the ILEC
  - Drive many smaller fiber builders out of business and prevent new entrants from entering the business—as capital would not be available and smaller players cannot offer custom network solutions to customers and comply with these regulations
  - ENTRENCH THE ILECs—due to diminished CFP activity
  - Ultimately result in HIGHER COSTS, POORER SERVICE and LESS CUSTOMER CHOICE

Because of the unique business model of CFPs, benchmark regulation would be problematic and not administrable

- CFPs sell **solutions**, not service elements, and price them as a package—applying benchmarks to CFPs' pricing simply does not and cannot fit the CFP business model. **The Commission would be attempting to apply regulation of a legacy service (special access) to a completely different product (complex advanced technology solutions).**
- A solution that, for example, connects five hospital buildings to each other and to a data center with high bandwidth 100% diverse circuits and also connects 15 affiliated clinics to the main hospital with unprotected lower bandwidth circuits, is priced as a bundle—it would be nearly impossible to map this to ILEC service elements upon which regulated pricing would be based.
    - CFPs may be asked to build diverse routes to ensure 100% uptime at critical public safety facilities or commercial facilities—these may cost more but offer a more resilient, robust and advanced network solution—yet benchmark regulation likely makes this too risky for the CFP
    - A service with dynamic bandwidth, such as SDN, where the customer uses 50 Mbps one day and 10 Gbps the next—cannot be mapped to a rate regime based on static service elements
    - Many CFP sales are single-package sales to multi-location customers spanning different ILEC territories, with different benchmarks. Even a simple Ethernet circuit from Boston to Hartford spans two ILECs. Determining whether a particular price complies with benchmark would be costly and uncertain, rendering many projects too risky to build.
    - Increased QoS justifies higher pricing, but it is uncertain how much higher a price would be reasonable under a benchmark price regime.

Because of the unique business model of CFPs, benchmark regulation would be problematic and not administrable (cont'd)

- **CFPs have higher costs** than ILECs;
  - CFPs pay higher franchise fees, building access fees, railroad crossing fees, bridge crossing fees, and construction permit fees;
  - CFPs have higher cost of capital and higher per-unit cost of physical inputs and labor
  - Thus it would be unfair to apply rates based on ILEC costs to CFPs.
  - A CFP would not know how much of an adjustment should be made for these factors because it does not know, for example, an ILEC's cost of capital.
- **CFPs have different rate structures** than ILECs
  - ILECs typically recover costs of construction through NRCs. Because of customer preferences, however, CFPs usually bear the cost of constructing new facilities and seek to recoup the investment through MRCs.
  - This will inevitably result in the CFPs having higher MRCs than the ILECs, even though the overall cost burden to the customer may be the same
  - It would be nearly impossible for a CFP to be certain what rate is permissible in this scenario
- Price cap regulation of ILEC pricing, which forms the basis for the benchmarks, is based on baskets, not individual rate elements; this gives ILEC the power to make adjustments within the basket to gain a competitive advantage over CFPs.
- CFPs would not invest in marginal projects due to the fear of running afoul of impossible-to-apply rate benchmarks and being subjected to costly complaint process that would divert management focus from the business. **End users would be the big losers in this scenario, and ILECs the big winners.**

And it is unnecessary to apply BDS regulation to CFPs

- CFPs face competition from the ILEC everywhere they operate
  - ILEC serves virtually every CFP location
- In almost all cases CFPs face competition from the cable company and often other fiber providers
- Given this competitive situation, CFPs are price takers, not price setters
- A CFP cannot sell at a price higher than ILEC unless it offers compensating value, such as guarantees of higher quality or a unique service (such as a network completely diverse from an existing network)
- This provides an appropriate basis for distinguishing between CFPs and ILECs, should the Commission decide to impose benchmark regulation on ILECs

LIGHTOWER OVERVIEW

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September 12, 2016

Lightower Today

Lightower's all-fiber network connects over 22,000 service locations, across 17 states, in the Northeast, Midwest, and Mid-Atlantic. Lightower delivers customized, high-performance connectivity where and when you need it with the award-winning support and network performance you require.

- Most prolific builder of open-access metro fiber networks over the past decade
- In-house fiber construction expertise and experience provide us with the ability to connect buildings quickly and cost effectively
- Trusted for mission-critical networking by some of the largest companies and organizations in the country, for core networking infrastructure
- Financially stable throughout our history
- Independent, privately-held company with clear go forward mission

COMPANY SNAPSHOT

- Founded in 2007
- Headquartered in Boxborough, MA
- $700MM+ in Revenue
- 4,000+ Customers
- 900+ Employees
- 8 Successful Acquisitions and Mergers

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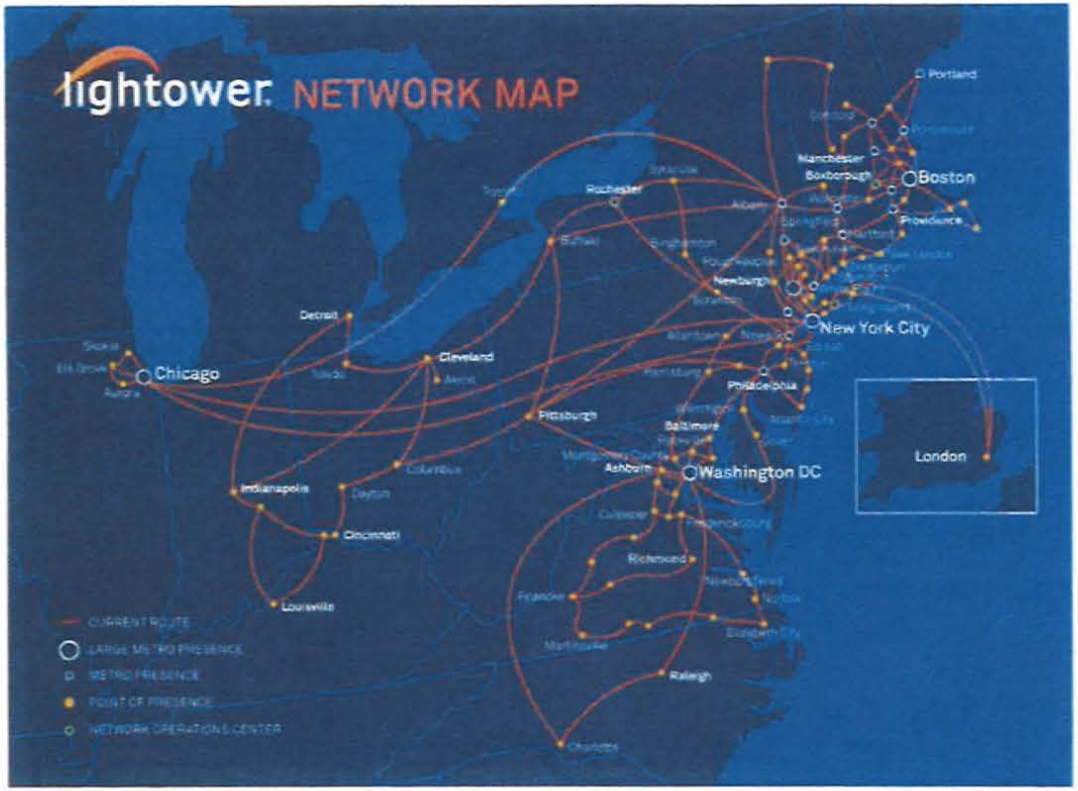
We Own the Most Dense Network In The Region

We own our all-fiber network, providing our customers with faster provisioning times, award-winning provisioning, and our industry-leading customer support.



- 33,000+ Fiber Route Miles
- 22,000+ Service Locations
- 275+ Data Centers Connected
- 500+ Telco Hotels & CO's Connected
- 40+ Financial Exchanges Connected
- 7,000+ Cell Sites & Small Cells Connected
- Direct Fiber Connectivity to Major Cloud Providers
- Geographically Diverse Network Operations Centers

Dark Fiber | Ethernet | Internet Access | Private Networks | Video Transport | Data Center & Cloud Connectivity

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Lightower in Massachusetts

- **Lightower is Trusted by More than 4,000 Customers**
  - Lightower is trusted by over 4,000 of the most respected colleges and universities in the nation, as well as school districts, health care networks, financial services firms, law firms, government agencies, technology and manufacturing companies, media properties and broadcasters, utilities & energy companies, e-commerce providers, ILECs, CLECs, and wireless carriers
- **Education – Lightower Enables Advanced eLearning Capabilities**
  - Lightower serves over 300 leading colleges, universities, and school districts
  - Lightower is an experienced E-Rate provider, including serving one of the largest school districts in the nation
- **Health Care – Renowned Providers Trust Lightower**
  - Over 200 leading research hospitals and care providers depend on Lightower for critical connectivity
  - Lightower helps care providers reliably and securely share patient data, including advanced imaging
  - Custom-designed health care networks help accommodate changing regulatory challenges
- **Federal, State, and Local Governments Depend on Lightower**
  - Lightower is an authorized vendor to federal, state, and local agencies under through established contract vehicles
  - Lightower's deep network infrastructure is uniquely suited to help any government agency from local to federal
- **Wireless Providers Turn to Lightower for Fast Wireless Connectivity**
  - Lightower provides Fiber-to-the-Tower and Small Cell connectivity to over 7,000 sites
  - Lightower provides dark and lit fiber to towers, and also providers transport to regional MSCs for carriers
- **Carriers Depend on Lightower for Access and Backbone Infrastructure**
  - Lightower works with CLECs to provide last mile access to our 22,000+ service locations
  - Lightower also provides backbone augmentation services to CLECs to expand their networks
- **Lightower is Committed to Our Customers**
  - Lightower's history shows repeated investments in both support resources and network infrastructure, including acquisitions and network expansions, to enable us to continue to grow and serve our customers even better

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LUMOS NETWORKS

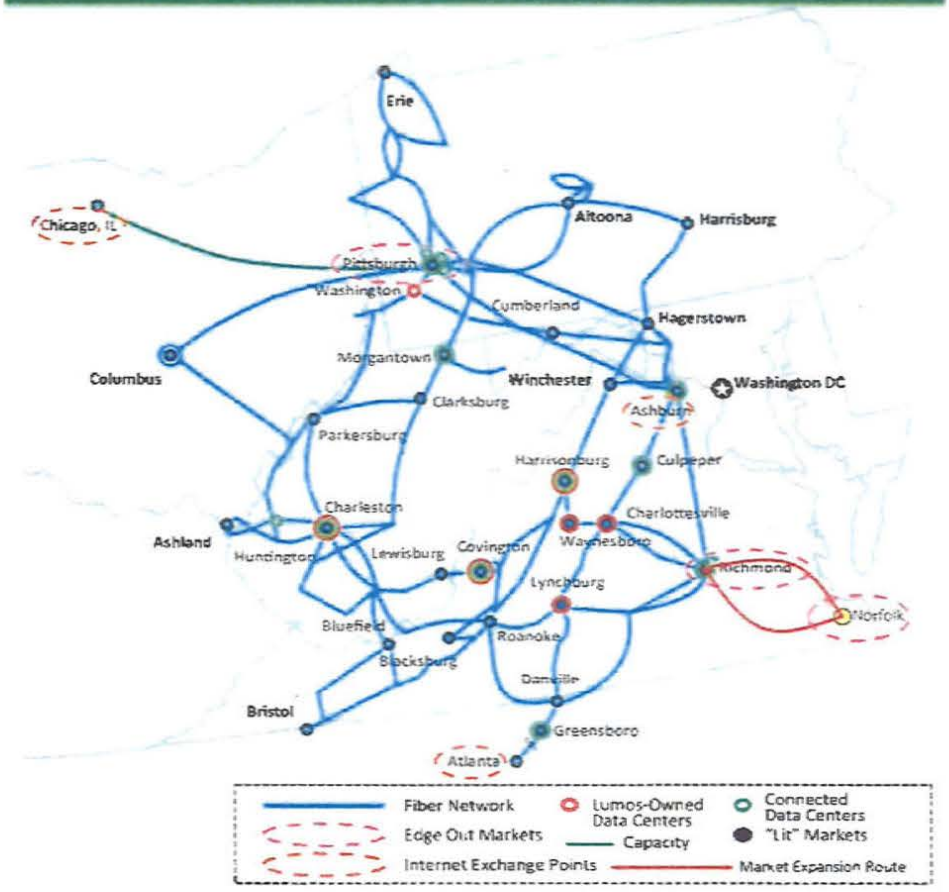
- Lumos Networks was created as a "spin off" from NTELOS on November 1, 2011 and is a public company that trades on NASDAQ.
- Lumos has a total of 8,985 fiber route miles/436,000 total strand miles in a Virginia, West Virginia and Pennsylvania. We have 3,215 total "on-net" locations and over 100,000 locations that are "near net" (within ½ mile of our fiber network).
- In its Enterprise (business) segment, Lumos targets "large locals" in 7 key verticals: government (city, county, state), education, finance, healthcare, media, manufacturing and professional services. Large locals are customers in which the preponderance of their total locations are in the Lumos fiber footprint.
- Lumos provides customized fiber network solutions to wireless carriers ("FTTC"). The company has built fiber to almost 1,300 wireless cell sites. Lumos provides over 1,600 BDS circuits to these cell sites
- Lumos also targets sales to other carriers who need "last mile" facilities to reach their own Enterprise Customers. Lumos supplies carriers with the lists of its "on-net" and "near net" locations. We update the lists frequently as we build more network.
- Since 2012, we have invested approximately $375m in building out fiber networks -- more than 100% of our free cash flow. In 2014, our capital expenditures were 42% of our revenue; in 2015, they were 57% of the total revenue.
- Lumos' recent 822 mile fiber build in Tidewater Virginia increases our total Enterprise addressable market by ~$221m, up ~67% vs. existing markets. Most importantly it enables LUMOS to be more competitive in its offerings to multi location enterprises across its footprint that would otherwise have to engage multiple ILECs and negotiate stand-alone pricing by location.

Lumos Networks Transformation

Total On-Net Locations	~1,200	3,217	+168%
Lit Buildings	1,051	1,922	+83%
Fiber Route Miles	5,800	8,985	+55%
Broadband Revenue	$21m	$31.0m	+47%
Unique FTTC Towers	70	1,295	+900%
Annualized FTTC/Ent. Rev	~$41m	~$88.2m	+115%
UNE-Based CLEC Customers	**122,046**	**69,728**	**-43%**

Lumos at a Glance

8,985 Fiber Route Miles; 436,451 Total Fiber Strand Miles
48-49 Avg Strand Count; 69% of Strand Miles: Lumos-owned



Attractive Fundamentals

- Total data contract value of ~$350m with avg. length of ~4 years
- Combined FTTC/Enterprise '16 growth tgt of 20%+
- Annualized Data Contribution Margin: ~98m ***(79% mrg)***
- Targeted 15-20%+ ROI on fiber deals
- FTTC/Enterprise revenue run rate is ~95% non-TDM
- 4G Data growth driving wireless backhaul demand
- On-net focus: 60% Data EBITDA margin target[1]
- Network Expansion to increase Addressable Market by ~$221m or ~67%

Revenue Opportunities

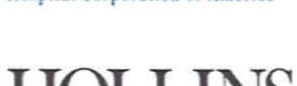
	Current[2]	Market Opportunity[3]
FTTC Unique Sites	1,295	9,540
On-Net Buildings	1,922	104,000
Total Connected Data Centers	36	100+

[1] Goals highlighted herein are long-term in nature and are subject to various risks and uncertainties, one or more of which could cause goals to be unattainable. You should not regard the inclusion of a goal in this presentation as a representation by any person that the results will be achieved

[2] As of 6/30/2016

[3] Based on Lumos Networks' internal research and analysis of data from research, surveys and studies conducted by third parties, such as Altman Vilandrie and Tower Source (for FTTC sites), Equifax Telecom and Stratsoft (for On-Net buildings) and public records databases (for data centers). Market Opportunity denotes wireless cell sites within 3 miles and buildings within ½ mile of the Lumos Networks fiber footprint and includes recently completed market expansion in Richmond and Norfolk

Key Enterprise Accounts



ST. ANNE'S-BELFIELD SCHOOL

ALL POINTS
BROADBAND
Live Connected.

Monday, February 13, 2012

Lumos Networks to Enhance Broadband Services for Virginia Community Colleges System

WAYNESBORO, VA. – Lumos Networks (NASDAQ: LMOS), a leading provider of fiber-based products across the Mid-Atlantic region , announced that the Virginia Community Colleges System(VCCS) has chosen Lumos Networksto deliver state-of-the-art broadband services to campuses across Virginia.

In making the announcement, David J. Keller, Senior Vice President Sales, Marketing and Customer Care, said, "Lumos Networks is honored to be selected to assist the VCCS in meeting their growing broadband communications needs. We look forward to extending our robust network and expertise to their efforts to deliver quality higher education and workforce training throughout the state for years to come."

The agreement enables more cost-effective and secure communications as well as enhanced continuity, increased speed and bandwidth over Lumos Networks' Metro Ethernet fiber backbone. The robust fiber network also affords the opportunity for future high-bandwidth applications and services for further expansion.

Tuesday, March 15, 2016

Lumos Networks Powers 17 Location Customized Wide Area Network ("WAN") for DePaul Community Resources

WAYNESBORO, Va.--(BUSINESS WIRE)-- Lumos Networks Corp. ("Lumos Networks" or the "Company") (Nasdaq: LMOS), a leading fiber-based provider of data, voice and IP-based telecommunication services in the Mid-Atlantic region, announces the continued strengthening of its relationship with DePaul Community Resources, a provider of mental health and human services in Central and Western Virginia. DePaul Community Resources is headquartered in Roanoke, Va. and provides foster care, adoption, and services for individuals with developmental disabilities. DePaul has been a customer of Lumos Networks since 2002, and over that time, Lumos Networks has customized a Wide Area Network (WAN) Ethernet solution for DePaul's 17 separate locations.

"Given our expansion efforts, particularly in more remote locations across the Commonwealth of Virginia and beyond, an increasingly robust network and increased bandwidth has become paramount in our ability to deliver on our mission of transforming the lives of children, families and adults with unique challenges," said Amanda Stanley, President & Chief Executive Officer. "The solutions Lumos Networks have provided ensure effective communications for DePaul across our footprint in order to open doors to hope and belonging."

"Given that DePaul continues to remain in expansion mode, they needed a system that could provide increased bandwidth and improve business efficiencies between their headquarters in Roanoke and remote locations," said Joseph McCourt, Chief Revenue Officer for Lumos Networks. "A customized wide area network provides a secure, fast and reliable connection for their organization and provides those they serve with a personal connection to the web. We are proud to call DePaul Community Resources a long-standing customer and look forward to growing with them for years to come."

About DePaul Community Resources

DePaul Community Resources opens doors to hope and belonging for countless children, families, and individuals with unique challenges across Central and Western Virginia. Since 1977, our services – including foster care, adoption, and services for individuals with developmental disabilities – have helped to provide safe homes, permanent families, integrated community support, and opportunities for deep healing. At the heart of DePaul is the belief that new things are possible when you belong. For more information about DePaul Community Resources, visit our website **DEPAULCR.ORG** or contact us at our main office in Roanoke at 540.265.8923.

About Lumos Networks

Lumos Networks is a leading fiber-based service provider in the Mid-Atlantic region serving Carrier, Enterprise and Data Center customers, offering end-to-end connectivity in 24 markets in Virginia, Pennsylvania, West Virginia, Maryland, Ohio and Kentucky. With a fiber network of 8,408 fiber route miles and approximately 379,000 total fiber strand miles, Lumos Networks connects 1,030 unique Fiber to the Cell sites, 1,363 total FTTC connections, 33 data centers, including 7 company owned co-location facilities, 1,642 on-net buildings and approximately 2,700 total on-net locations. In 2014, Lumos Networks generated over $106 million in data revenue and nearly $52 million in Adjusted EBITDA over our fiber network. Detailed information about Lumos Networks is available at **WWW.LUMOSNETWORKS.COM.**

Monday, June 3, 2013

Lumos Networks signs long-term Enterprise Contract with HCA Virginia in Richmond, Virginia

WAYNESBORO, Va.--(BUSINESS WIRE)-- Lumos Networks Corp. (NASDAQ:LMOS), a leading provider of fiber-based bandwidth infrastructure & IP Services in key mid-Atlantic markets, today announced that it signed a multi-year Ethernet network contract with HCA Virginia in Richmond, Virginia.

The fiber network build will connect 10 key HCA Virginia facilities, satellite offices and critical care locations to its Richmond Data Center All 10 facilities will be "on-net," meaning they will all be linked directly to Lumos' fiber network. The project is scheduled for completion in the third quarter of 2013 and will bring to 17 the number of HCA Virginia facilities connected on Lumos' fiber network through advanced Ethernet services.

"We have had great success with the customized networks solutions Lumos Networks has built for us since our relationship began in 2000. We are excited that they will be helping us build the next generation of a healthcare grade network in Richmond capable of handling real time access to critical patient information while providing the safety and security we need. It has been our thinking that better technology means better patient care and we're able to provide such in Richmond as a result of our relationship with Lumos Networks," said Tom Pagano, Chief Information Officer HCA Capital Division – Information Technology & Services.

"It is my pleasure that our first publicly announced Ethernet fiber contract in the Richmond, Virginia market is with such a long-standing client like HCA Virginia. This HCA Virginia contract is a great win for Lumos and is one of a half dozen key contracts that we signed as a part of the pre-selling process we began in late 2012 to prepare for the launch of fiber services in the Richmond market," said Joseph E. McCourt, EVP and Chief Revenue Officer for Lumos Networks.

When Lumos lights up Richmond with fiber services in the third quarter, the network will consist of 92 miles of both metro and long haul fiber and will be strategically positioned to efficiently reach a significant number of large Enterprise and cell site opportunities. The fiber network will connect back to the existing Lumos footprint. Richmond has a population of 1.3 million in its metro area, which significantly increases the addressable market of the Lumos fiber footprint.

Mr. McCourt added, "Richmond is going to be a 100Gbps City for Lumos, day one. Richmond has a vibrant economy, anchored by State government facilities, Fortune 500 Enterprises, a strong healthcare infrastructure and an unemployment rate of 5.9%, well below the national average. Our large multi-tenant Enterprise and our Carrier customers all agree that the demand for high quality, low latency bandwidth on a secure fiber network continues to exceed expectations. We are already sourcing Enterprises in need of redundant fiber access to reach critical data centers in our existing footprint, as well as other carrier POPs and metro locations."

About HCA Virginia

As the commonwealth's most comprehensive health care network, HCA Virginia operates 13 hospitals and more than a dozen outpatient centers and is affiliated with 3,000 physicians in Central, Southwestern and Northern Virginia. In addition to being one of Virginia's largest employers, it provides approximately $100 million in charity care to uninsured patients each year and pays $100 million in taxes. In Central Virginia, HCA Virginia includes 4 imaging centers, 6 outpatient surgery centers, more than 50 physician practice locations and the 7 hospitals we are best known for - Henrico Doctors', Parham Doctors', Retreat Doctors', West Creek Emergency Center, Chippenham, Johnston-Willis, John Randolph and Spotsylvania Regional.

LUMOS NETWORKS LAUNCHES 110-MILE METRO ETHERNET FIBER NETWORK IN RICHMOND, VIRGINIA

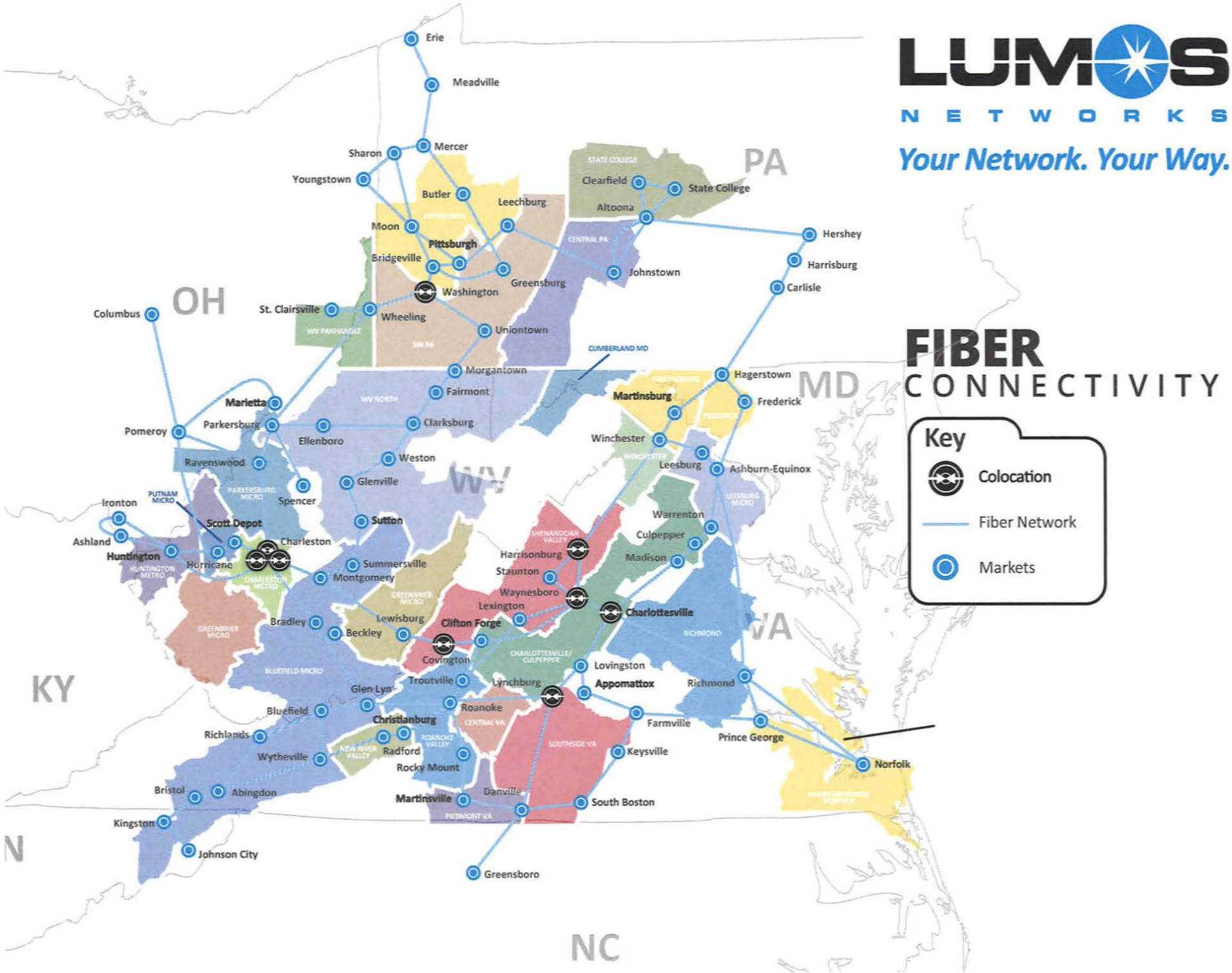
Thursday, October 31, 2013 - 7:05am

WAYNESBORO, Va.--(BUSINESS WIRE)-- Lumos Networks Corp. (NASDAQ:LMOS), a leading provider of fiber-based bandwidth infrastructure & IP Services in key mid-Atlantic markets, announced that it has officially launched Metro Ethernet services in the Richmond, Virginia metropolitan market. Including the previously announced anchor contract win to provide Ethernet services to 10 locations for national hospital provider HCA, Lumos has already won several major Enterprise and Carrier Network accounts.

"I am pleased to announce that we have 'lit' up service on our 110 mile fiber Ethernet metro ring in Richmond, which is a key part of Lumos' 'edge-out' market strategy to expand our fiber network," said Joseph E. McCourt, Chief Revenue Officer for Lumos Networks. "Market research information estimates that the annual market for Strategic Data Enterprise spending in the Richmond metropolitan market is about $80 million. We designed and built our network in a very strategic manner in order to access as many key Enterprises, Data Centers and cell towers as possible. Over time, we expect to be able to leverage our new strategic fiber assets to aggressively pursue Fiber to the Cell backhaul opportunities in the Richmond market with our existing wireless operator customers."

This new fiber network in Richmond, which was 100G ready at launch, is some of the densest in the Lumos Network footprint and will also provide a launch point for Lumos to pursue transport traffic in key routes, namely Richmond to Ashburn, Va. and Richmond to Charlottesville, Va.

"Our Richmond network provides us a beachhead from which to pursue multiple data center opportunities in both Richmond and the Ashburn/Washington, D.C. corridor," said Craig Drinkhall, Vice President of Product and Engineering at Lumos Networks. "We are already sourcing enterprises in need of redundant fiber access to reach critical data centers in our existing footprint, as well as other carrier POPs and metro locations."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Mercer
Sharon
Youngstown
Butler
Leechburg
Moon
Pittsburgh
Bridgeville
Greensburg
Washington
Columbus
St. Clairsville
Wheeling
Uniontown
Morgantown
Fairmont
Marietta
Parkersburg
Clarksburg
Pomeroy
Ellenboro
Weston
Ravenswood
Glenville
Spencer
Sutton
Ironton
Scott Depot
Ashland
Huntington
Hurricane
Charleston
Summersville
Montgomery
Bradley
Beckley
Lewisburg
Clifton Forge
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Glen Lyn
Troutville
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Richlands
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Kingston
Johnson City
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Norfolk
Hershey
Harrisburg
Carlisle
Johnstown
Altoona
Clearfield
State College
CUMBERLAND MD

Unite Private Networks
at a glance

Unite PRIVATE NETWORKS

Percentage of revenue spent on CAPEX

2015

150%

2016*

60%

*projected

We serve over 3,750 on-net buildings across the US

Our network footprint spans over 6,200 route miles

20
states we do business in

300
communities across the US

1998
year we were founded

142
employees across seven offices

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